

CLAIMS

What is claimed is:

1. A structural cell system for supporting hardscape areas that enables tree root growth and accommodates filtering, retention, storage and infiltration of storm water while preventing hardscape damage, comprising;  
a plurality of structural cells capable of being positioned below a hardscape, the structural cells having openings sized to accept tree roots;  
one or more permeable barriers around the structural cells;  
water ingress means into the plurality of structural cells; and  
water egress means from the plurality of structural cells.
2. The system of claim 1, wherein the hardscape may be sidewalk, parking or roadway pavement.
3. The system of claim 1, wherein the open structural cells are capable of storing water.
4. The system of claim 1, wherein the open structural cells are capable of storing low compacting tree-rooting medium.
5. The system of claim 4, wherein the tree-rooting medium is capable of filtering the storm water.
6. The system of claim 1, further comprising a soil injection port into the plurality of structural cells through the hardscape.
7. The system of claim 1, wherein the structural cells are positioned in two or more layers.

8. The system of claim 7, wherein at least one layer includes structural cells filled with water and at least one layer filled with soil.

9. The system of claim 7, further comprising one or more permeable barriers positioned separating the layers.

10. The system of claim 1, further comprising a cell inspection port through the hardscape.

11. The system of claim 1, further comprising one or more impermeable barriers positioned between the structural cells and the hardscape.

12. The system of claim 1, further comprising one or more impermeable barriers positioned between the structural cells and the surrounding soil.

13. The system of claim 1, wherein the structural cells are assemble in a vertical configuration.

14. The system of claim 1, wherein the structural cells are assemble in a corbel configuration.

15. The system of claim 1, further comprising one or more water wicks.

16. The system of claim 1, wherein the water ingress means is a storm drain inlet.

17. The system of claim 1, wherein the storm drain inlet includes a filter.

18. The system of claim 1, wherein the water ingress means is through permeable hardscape.

19. The system of claim 1, wherein water egress means is water infiltration into surrounding soil.

20. The system of claim 1, wherein water egress means is a storm drain.

21. The system of claim 1, further comprising a means for flushing the system with water.

22. A multilayered structural cell system for supporting hardscape areas that enables tree root growth and accommodates filtering, retention, storage and infiltration of storm water while preventing hardscape damage, comprising;

a first layer of structural cells for short-term water storage positioned below the hardscape, the first layer of structural cells being capable of short term water storage;

water ingress means into the first layer;

a second layer of structural cells positioned below the first layer, the second layer of structural cells being capable of storing tree-rooting medium supporting the growth of tree roots;

a third layer of cell structure positioned below the second layer, the third layer of structural cells being capable of long-term water storage;

water egress means from the third layer of structural cells;

a first permeable barrier separating the first and second layer;

a second permeable barrier separating the second and third layers; and

each of the layers being in fluid communication with the other layers.

23. The system of claim 22, wherein the second layer of structural cells have one or more openings sized to accept tree roots.

24. The system of claim 22, wherein the tree-rooting medium is capable of filtering the storm water between the first layer and the third layer.

25. The system of claim 22, further comprising a barrier positioned between the first layer and the hardscape.

26. The system of claim 22, wherein the hardscape may be sidewalk, parking or roadway pavement.

27. The system of claim 22, further comprising one or more water wicks between layers.

28. The system of claim 22, further comprising a soil injection port through the hardscape.

29. The system of claim 22, further comprising cell inspection port through the hardscape.

30. The system of claim 22, further comprising a flushing cleanout port.

31. The system of claim 22, further comprising one or more impermeable barriers positioned between the first layer of structural cells and the hardscape.

32. The system of claim 22, further comprising one or more impermeable barriers positioned between the first, second and/or third layers of structural cells and the surrounding soil.

33. The system of claim 22, wherein the structural cells are assemble in a vertical configuration.

34. The system of claim 22, wherein the structural cells are assemble in a corbel configuration.

35. The system of claim 22, further comprising one or more water wicks.
36. The system of claim 22, wherein the water ingress means is a storm drain inlet.
37. The system of claim 22, wherein the storm drain inlet includes a filter.
38. The system of claim 22, wherein the water ingress means is through permeable hardscape.
39. The system of claim 22, wherein water egress means is water infiltration into surrounding soil.
40. The system of claim 22, wherein water egress means is a storm drain.
41. The system of claim 22, further comprising a splitter system allowing some water to pass directly from the first layer to the third layer.
42. The system of claim 22, further comprising one or more weep holes to allow draining.
43. The system of claim 22, further comprising a means for flushing the system with water.
44. A method of making an urban tree growth system; comprising:  
forming an opening in the hardscape at least large enough for a rootball of a tree;  
positioning a plurality of structural cells in layers around the opening under the hardscape;  
inserting the rootball in the opening; and  
filling the opening and some of the structural cells proximate the opening with a tree-rooting medium for supporting tree growth.

45. The method of claim 44, further comprising filling some of the structural cells with water wherein the water is in fluid communication with the structural cells with the tree-rooting medium .

46. The method of claim 44, further comprising flushing the system with water.